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RISK ATTITUDES AND MIGRATION EXPERIENCE

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Abstract: Although risk and uncertainty are intrinsic to human migration, there is surprisingly little explicit research on the willingness to take risks in this context. This paper analyses whether migrants are more or less likely than non-migrants to be risk tolerant, and whether these differences are gendered. Attitudes are explored in terms of responses under conditions of both risk and uncertainty, and self assessment of capabilities is also taken into account. The research is based on a sample of students who provide a relatively homogeneous group in socio-economic terms, and relatively large numbers of individuals with experiences of temporary migration. Their attitudes to risk were assessed under experimental conditions, which measured their willingness to take risks on hypothetical gambles under different conditions. While there are some differences between males and females, and between migrants and non-migrants, but the outstanding finding is the far greater risk tolerance of female migrants as opposed to female non-migrants, especially when compared to males.

Keywords: migration, gender, Ellsberg paradox; risk; uncertainty

RISK ATTITUDES AND MIGRATION EXPERIENCE

Introduction

Risk and uncertainty are central to individual migration behaviour but there is surprisingly little research which explicitly engages with the notions of risk and uncertainty in migration. This is equally true of the migration literature (for example, Roberts and Morris, 2003; Massey et al, 1993) and, with very few exceptions, of researchers starting from the generic conceptualization and modelling of risk within the behavioural economics tradition. Migrants, or potential migrants, face a double source of risk and uncertainty. Firstly, they necessarily have imperfect knowledge as to future changes in, say, wages or social mobility in any location. But this is compounded by having to consider not just the place they reside, are familiar with, and have accumulated experiential knowledge of. Instead, migration also involves movement to an unfamiliar place that they are likely to have less knowledge about, representing greater uncertainty.

This paper seeks to add to the sparse literature in this field by focussing specifically on individual attitudes, and asking whether migrants or non migrants are more averse to, or tolerant of, risk and uncertainty. In particular, the main aim is to examine the inter-relationships between previous migration experience and gender in terms of shaping attitudes to risk and uncertainty. This is developed through two main strands of analysis. First, we focus on responses to risk as opposed to uncertainty. The starting point for this is testing the Ellsberg paradox (Ellsberg 1961, and Fox and Tversky 1995) which asserts the power of ambiguity aversion: individuals prefer risk to uncertainty. How do migrants versus non migrants respond to risk versus uncertainty, and how is this gendered? Second, we consider the extent to which individual self assessments of capacities, that is of competence, mediate these decisions.

Migrants are a very heterogeneous group in terms of their socio-demographic characteristics, motivations and experiences. In this study we focus on one particular group of students containing those with and without experience of temporary migration. For analytical purposes, this has the advantage of controlling for both the duration of migration and for socio-demographic characteristics. The study is based on a sample of 539 Slovak students, and their willingness to take risk is analysed using mixed-design Anova.

Risk/uncertainty and migration: a conceptual framework

Although there are many definitions of risk and uncertainty (Camerer and Weber 1992) we draw on Knight's (1921), classic distinction between known and unknown uncertainties (Tversky and Kahneman 1992). In the case of migration, as with most socially-situated actions as opposed to experimental conditions or hypothetical decisions, there is a degree of uncertainty; not all the major associated risks are known. This varies with the type of migration but is ever present: even a student migrant on an exchange visit to a foreign university, where housing and courses have been pre-arranged and mentors are provided, faces considerable uncertainties; for

example, will (s)he be homesick and how effective will their language skills be outside the language laboratory. They face a mixture of risk and uncertainty, but we know very little about how attitudes to migration under different conditions. Moreover, migration decisions are rarely made without some knowledge about risks in the destination, so that individual capabilities are also important in determining attitudes to risk and uncertainty.

The conceptual starting point for the paper is the well known work of Tversky and Kahneman (1974), and their associates, on the notions of risk aversion and risk tolerance. There are substantial differences in risk tolerance both between socio-economic and socio-demographic groups, and amongst individuals within these. For example, research on the 'demography of risk' generally indicates that men tend to be more risk tolerant than women, young people more than older people, and Hispanics and Asians more than whites (see Barsky et al 1997, Donkers et al 2001, Halek and Eisenhauer 2001, Hartog et al 2000 and Sahm 2007). There is considerable research in this field, mostly focussed on either laboratory simulations related to hypothetical, and occasionally real, gambling or on health and financial investments. In contrast, there has been little research on the relationships between willingness to take risks and migration. Yet, migration is obviously characterised by risk and uncertainty, so that migrants are generally more likely than non migrants to be risk tolerant, although there are exceptions (as in extremely difficult political or environmental conditions, when non migration poses greater risk and uncertainty). Chiswick (2000, p. 52) notes that '... one of the standard propositions in the migration literature is that economic migrants tend to be favourably 'self-selected'. That is, economic migrants are assumed, to be more able, ambitious, aggressive, entrepreneurial and implicitly risk tolerant than non migrants.

Although there is limited research on migration and willingness to take risk, some empirical evidence is available, especially for internal migration. Several large-scale surveys on risk attitudes have established that immigrants have higher risk tolerance levels than non migrants in the destination populations. Barsky et al (1997: 545) used data on 11,707 individuals provided by the US Health and Retirement Study survey (HRS) which measured preference parameters relating to risk tolerance. They found that measured risk tolerance had significant predictive power in relation to decision making in several areas of risky behaviours, including migration. Interestingly, they found that immigrant status had the highest positive association with risk tolerance ($R^2 = 0.303$) amongst the predictors of risky behaviour they analysed. This was observed not only for international in-migrants but also for internal or domestic in-migrants to the US West (Barsky et al 1997). The migration correlates of risks, however, overlapped with correlates of race and ethnicity in the HRS sample. Most immigrants were of Hispanic and Asian origin, and these ethnic groups had higher risk tolerance levels than the white population. Nevertheless, Barsky identified a positive association between risk tolerance and immigrant status, even after controlling for socio-demographic factors, such as ethnicity, but at relatively low significance levels.

In another USA study, Halek and Eisenhauer (2001) used life insurance data to estimate the Pratt-Arrow coefficient of relative risk aversion for each of nearly 2,400 households from the HRS data base. They also found that those who have already demonstrated a willingness to engage in risk-taking by migrating across national

borders are significantly less risk averse than the indigenous population in the destination region (Halek and Eisenhauer 2001, 22).

The most substantial research in Europe has been in Germany, based on the SOEP sample which provides data – including risk propensity measures - on some 22,000 individuals. This provides evidence that internal migrants in Germany were more risk tolerant than non migrants (Dohmen et al 2006). Jaeger et al (2007, 3), analysing a smaller SOEP sample (10,967 individuals), found that, after controlling for a range of socio-economic individual characteristics, such as unemployment and marital status, the willingness to take risk accounts for much of the residual variance in migration intentions: ‘being relatively willing to take risks is associated with an increase of at least 1.6 percentage points in the probability of ever migrating between 2000 and 2005, even after conditioning on individual characteristics. This effect is substantial relative to the unconditional migration propensity of 5.1 percent’. An important aspect of the German research for this paper is whether risk aversion can be considered context specific or generic, that is whether general measures of risk tolerance/aversion provide reliable measures for predicting attitudes or behaviour in particular areas of activity (Dohmen et al 2005, 33) such as investment, smoking and migration. The findings for migration, although less strong than in other fields, were still significant when using generic measures.

This paper extends research on the gendered nature of migrant versus non migrant risk tolerance/aversion in two ways. First, by analysing gendered migrants versus non migrants’ responses to risk as opposed to uncertainty, drawing on the Ellsberg paradox (Ellsberg 1961) which asserts the power of ambiguity aversion: individuals prefer risk to uncertainty. This resonates strongly with migrant decision making where different destinations represent varying combinations of risk and uncertainty. Secondly, we consider the extent to which such decisions are related to individual self assessments of capacities, that is of competence. This also resonates with individuals necessarily have varying levels of perceived competence in dealing with the demands of migration.

Methodology

Most of the limited research on migration and risk is based on secondary sources (large scale-surveys) which have sub-sample size limitations when analysing particular social groups such as migrants. In Jaeger’s sample, for example, only 1.2 percent per year emigrated. In Barsky’s sample, there were 1,139 immigrants amongst the 11,707 respondents, but their diversity in terms of the timing, duration and channels of migration, although probably significant, was unrecorded. This project therefore undertook primary data collection focussing on one particular migrant group, university students. This has three advantages. First, they are relatively homogeneous in terms of age and education, facilitating focus on differences related to migration and gender. Secondly, students’ experiences of migration are relatively homogeneous, most having been temporary migrants. Thirdly, young adults are the most mobile demographic group in Europe, and this is especially marked in the transition economies of Central and Eastern Europe (see Baláž et al 2004 on young

adult migration in Slovakia); consequently, this target population was likely to include relatively large numbers of migrants.

The research is based on a sample of 539 students at Bratislava Economics University (EUBA) aged 20 - 26 years. This was a stratified random sample, in which we aimed to maximize the size of the migrant sub sample, while also reflecting the gender distribution in the student population. Female students accounted for 62% of the sample, compared to 61.5% of the student population of EUBA in 2008. All the students in the sample were ethnically white and Slovak citizens, and of broadly similar ages and educational backgrounds.

A migrant was defined as having spent at least 3 months working and/or studying outside Slovakia, other than in the Czech Republic¹. The share of females in the total sample (N = 334; 62.0%) was slightly lower than the share of females amongst the migrants in the sample (N = 106; 68.3%). The migrants had worked and, or studied in more than 30 countries, notably the USA (65 students), UK (44), Germany (11), Ireland (9), and France and Austria (8 each). Most (temporary) migrations involved summer jobs, particularly in the USA and UK, in order to earn money and learn English. The risks associated with this type of migration are at the lower end of the spectrum of risks associated with different forms of migration, but are relatively homogeneous across the sample.

We examined risk attitudes in two contexts. First, migrant and gender differences in responses to risk versus uncertainty, and when faced with the Ellsberg paradox, that is making separate as opposed to a comparative decision about these. Secondly, we considered the importance of (self assessed) knowledge in what can be termed a competence-informed context². In both contexts, we use the methodology developed by Fox and Tversky (1995), based on hypothetical gambles, to explore differences between men and women migrants and non migrants. The emphasis therefore is on gendered differences between migrants and non migrants in their willingness to take risks in general rather than their willingness to take migration specific risks. This raises questions about causality that we return to later.

Findings: gender and migration status differences in attitudes to risk and uncertainty

Migrant and gendered differences in response to risk versus uncertainty are considered in relation to the Ellsberg paradox which compares decisions taken under risk and uncertainty (Ellsberg 1961). This has several variants but the basic variant asks subjects to draw a ball of a certain colour from two urns. Urn 1 contains 50 red and 50 black balls (risk conditions) while Urn 2 contains 100 balls where the distribution of probabilities of red and black balls is unknown (uncertainty conditions). Most people prefer Urn 1, so the main conclusion from the Ellsberg

¹ The Czech Republic is main destination for Slovak migrants. Language and cultural proximity between the Czech and Slovak Republics is high and we did not consider the Czech Republic a foreign country for this research.

² When incomplete cases were excluded, the sample for examining the Ellsberg paradox was 399 and that for the competence effects was 316.

paradox is that clear information is preferred to vague information, that is risk is preferred to uncertainty. Individuals do not possess all the information required for optimal decision making, and therefore cannot maximize their utilities. Instead, a satisfying rather than an optimal decision is taken. There are direct parallels here with the dilemmas encountered in migration decision making.

Fox and Tversky (1995) developed a variant of the Ellsberg paradox which is employed in this study. Their experiment suggested that ambiguity aversion only holds under conditions where individuals *compare* outcomes from decisions under risk and uncertainty. Fox and Tversky's experiment presented their student participants with the following decision making exercise: 'Imagine there is a Bag A on the table filled with exactly 50 red poker chips and 50 black poker chips and a second Bag B filled with 100 poker chips that are red and black, but you do not know their relative proportion. Suppose that you are offered a ticket to a game that is to be played as follows. First you are to guess a colour (red or black). Next, without looking, you are to draw a poker chip out of one of two bags. If the colour that you draw is the same as you predicted, then you will win \$100, otherwise you win nothing. What is the most you would be willing to pay for such a game for each of the bags?' Half of the students performed a comparative task of considering the two options – under risk and uncertainty – together, while the other half considered the two gambles separately.

In our research, which replicates the Fox and Tversky (1995) experiment, the EUBA students were asked to gamble on Box A which represented risk, and Box B which represented uncertainty. The findings are summarised in Table 1 for the untransformed data, and the mixed-design ANOVA which tests for the Ellsberg paradox using untransformed variables is reported in Table 2³; all effects are reported as significant at $p < 0.05$. There are two within-subject factors: (1) prospect - that is, how individuals respond to risk versus uncertainty; and (2) task conditions - how they respond under comparative versus non-comparative decisions. Two between-group factors are considered: the influence of gender, and migration experience (those who have previously been migrants versus non-migrants).

The EUBA students generally expressed high risk aversion. Starting with a sum of 100 EUR, it would be anticipated that risk neutral economic agents would bet 50 EUR per game. However, the average values of the bets placed ranged from EUR 18.06 to

³ Mixed-design ANOVA was used to test differences in willingness to pay by subjects in both these contexts. This tests for mean differences between groups (in terms of gender, migration experience etc) whilst subjecting individual participants to repeated measures of how they respond to different experimental risks in order to test for within-subjects differences. The mixed-design ANOVA procedure is based on assumptions on sample size, normality of the dependent variable distribution, homogeneity of variance, independence and sphericity. There were more than 20 cases per cell. Each participant's responses were sampled independently from the other participants' responses. Tests were performed on transformed variables. Levene's test indicated that the variances were homogenous for all levels of the repeated-measure variables. The repeated-measures variables had only two levels in both experimental contexts, so that the sphericity condition was met and Mauchly's test of sphericity was not performed. The effect size for mixed-design ANOVA is calculated by the partial eta squared statistic (η^2 , analogous to R^2 from multiple linear regression). The partial eta squared compares the Sum of Squares of the effect considered to the Sum of Squares and error variance that is attributable to the effect ($\eta^2 = SS_{\text{effect}} / (SS_{\text{effect}} + SS_{\text{error}})$). As a rule of thumb, effects over 0.06 are considered medium, effects over 0.14 large (Cohen 1988).

26.23, depending on the type of gamble in a pure chance context. As the variables were positively skewed, and some had non-normal distributions, their square roots were used to bring the large scores closer to the centre.

The prospect condition was significant and, in general, the EUBA students were willing to bet more under risk than under uncertainty conditions. However, task conditions were also important: the amount they were willing to gamble when faced with risk versus uncertainty was much higher in comparative gambles when they were able to choose between risk and uncertainty. In comparative conditions, the average clear bet (known risk) was 22.70 EUR (21.92 for females and 27.86 for males, $t = -2.303$, Sig. 0.022), while the average vague bet (uncertainty) was EUR 18.29 (16.55 for females and 19.22 for males, $t = -1.208$, Sig. 0.228). In non-comparative conditions the average clear bet (known risk) was 20.75 (19.90 for females and 24.55 for males, $t = -1.908$, Sig. 0.057), while the average vague bet (uncertainty) was EUR 20.25 (19.14 for females and 24.60 for males ($t = -2.255$, Sig. 0.025). Women proved more risk averse than men. Gender differences in the Ellsberg paradox (risk versus uncertainty) were greater in the comparative condition and were also only significant only in this condition. Task condition (comparative vs. non-comparative) was insignificant *per se* when comparing males and females, and mattered only where it interacted with prospects, that is when bets were placed in risky or uncertain prospects (Table 2, $F=4.929$, Sig. 0.027).

A further perspective on the observed non-significance of gendered differences amongst the EUBA students in a pure chance context is provided by considering their migration experiences. Our study was deliberately constructed to ensure there was a relatively large sub-sample with migration experiences to allow for testing of migration-related differences in risk taking. Gendered differences are strongly interwoven with migration experiences in the sample. As discussed below, female migrants had much stronger risk taking propensities than female non-migrants. Therefore, when only non migrants are considered, the difference in risk taking between males and females is highly significant (Sig. $p = 0.002$) as expected, with the average bet by females (EUR 17.45) being much lower than for males (EUR 25.04). This was not the case with male versus female migrants.

The ANOVA test of between-group effects initially found no significant effects for either gender (Sig. 0.08) or migration (0.919), considered separately (Table 2, tests of between group effects). However, the interaction term 'gender * migration' was significant ($p = 0.024$). Tests of the within-subjects and between-group effects indicated that male and female migrants behaved differently in the Ellsberg paradox of ambiguity aversion (Table 1). Female migrants were willing to bet larger sums than female non-migrants in all four experimental tasks they were presented with, and these differences were statistically significant in three tasks. However, when making vague bets (uncertainty) in comparative conditions, that is when uncertainty is most pronounced, female migrants were also ambiguity averse, and the differences between female migrants and non-migrants were insignificant (EUR 18.31 versus EUR 15.93, $t = -1.126$ Sig. = 0.261). In contrast, the differences between male migrants and non-migrants were statistically insignificant for all the tasks undertaken. In other words, it did not matter whether male migrants faced risk or uncertainty, comparative or non-comparative conditions: in other words, although they consistently bet lower stakes than non migrants, the differences were statistically insignificant.

Capabilities, optimism and over-confidence: gender and migration

Individual willingness to take risks may also be related to optimism and overconfidence. Optimism refers to favouring and/or selecting positive information and beliefs, including beliefs about personal knowledge and capabilities. Individuals tend to overestimate their competence compared to their peers (Lovallo and Kahneman 2003). Overconfidence refers to (ungrounded) beliefs in one's knowledge, abilities, intuitions and judgements. Most individuals are overconfident about their relative abilities and '... the inside view which creates that confidence leads them to neglect the quality of their competition' (Camerer and Lovallo 1999, 316). This may lead to risk taking (Barber and Odean 2001).

The EUBA students rated their skills and capabilities, on a scale from 0 to 10, with respect to a number of attributes: 'flexibility', 'ability to estimate situations more correctly', 'ability to manage their studies', 'ability to deal with problems' and 'willingness to take risks' (Table 1). Both males and females displayed an optimistic bias, when comparing their own abilities to their peers in all these self-assessments, with their average rating being above 5 except for risk taking, where it was close to 5. They assessed their ability to manage their studies most optimistically, scoring an average above 7⁴. Optimistic judgements about personal capabilities did not appear to be related to migration experience. T-tests between male/female migrants/non-migrants were mostly insignificant (Table 1). There were two exceptions. Male migrants tended to state higher levels of ability to manage their studies, while female migrants reported significantly greater willingness to take risks than female non-migrants.

We conclude that neither optimism nor overconfidence was related to migration experience. What mattered was self-declared willingness to take risks. This assumption is supported by students' self rating of their capabilities. The average self-assessment (scale 0-10) for the statement 'I am willing to take higher risks' was 4.89 for female migrants, which was significantly different from the 4.13 for female non-migrants ($t = -3.112$, Sig. 0.002) (Table 1). On the other hand, the difference in self-assessments between male migrants versus male non-migrants was very low (5.79 versus 5.74, $t = -0.154$, Sig. 0.878).

Discussion

In terms of the Ellsberg paradox, Fox and Tversky's own experiment indicated general risk aversion, as the average gamble in each game was lower than \$50 (the sum assumed by the hypotheses of risk neutrality). The group in the comparative situation, expressed strong ambiguity aversion and were ready to pay on average \$24.34 for the clear bet (known risk), but only \$14.85 for the vague bet (uncertainty). The group in the non-comparative situation was ready to spend similar sums on the

⁴ The US College Board conducted a survey of 1 million students in the 1970s. The survey asked students to rate themselves in comparison to their peers. Some 70% said they were above average in leadership ability, while only 2% rated themselves below average. Some 60% of students considered themselves above the median, and only 6% below, in athletic prowess. In their ability to get along with others, some 60% rated themselves in the top decile, and fully 25% placed themselves in the top 1% (Lovallo and Kahneman 2003). In this respect, the EUBA students were similar in displaying optimistic opinions about their own abilities.

clear and vague bets on average: \$17.94 and \$18.29 respectively. These data indicate not only risk aversion, but also the importance of comparative versus non comparative conditions. Their findings were confirmed in later research where individuals gambled with real money, and in other experiments (e.g. Fox and Weber 2001).

Our analysis of the 2008 sample of EUBA students displayed broadly similar behaviour patterns to the Stanford students in 1995, indicating that the prospect condition was significant: EUBA students were willing to bet more under risk than under uncertainty conditions. However, in common with the Stanford students, task conditions were also important and they were willing to bet more in comparative gambles when they could choose between risk and uncertainty. The average sizes of bets were quite similar in Bratislava and Stanford, and almost identical when gender differences in sample structures were taken into account (there was a higher proportion of females in the EUBA sample). There is therefore some evidence that risk aversion levels for particular socio-economic groups (university students in this case) are similar across countries and time periods.

Turning to the main focus of this paper, women proved more risk averse than men in both comparative and non comparative conditions. However, although gender differences in the Ellsberg paradox – that is faced with risk versus uncertainty - were higher in comparative conditions, they were not statistically significant until the interactions between prospects and conditions were considered (Table 2). The finding that gender differences are non-significant seems inconsistent with the considerable contrary evidence on gender differences in the broader field of research on risk (but for exceptions, see Daruvala 2007, Ronay and Kim 2006). A meta-analysis of 150 studies (Byrnes et al Schaffer 1999), for example, found that men were more risk tolerant in 14 out of 16 observed types of risk behaviour.

It is important, however, to consider the range of factors influencing risk taking attitudes in different contexts. Much of the research on individual risk taking focuses on financial decisions, reflecting the prominence of the topic and the availability of data from financial markets and institutions. Almost all research on financial risk taking indicates higher risk aversion by women (for example, Bernasek and Shwiff 2001, Schubert et al 1999). Studies of financial risk taking, however, are made in a competence-informed context, where prior knowledge is brought to play. Men generally perceive themselves to be more capable and are willing to bet larger amounts, compared to women. Therefore, studies of financial risk taking cannot explain gendered differences in a ‘pure chance’ risk context, such as gambling on selecting coloured balls.

The second main strand of the analysis has focussed on migration experiences. The influence of migration has been largely absent in studies of risk taking. Most researchers do not report the shares of migrants in their studies. Barsky et al (1997) and Dohmen (2006) are exceptions but, given the nature of their secondary data, the shares of reported migrants in their analyses are understandably relatively small and unlikely to influence their findings on gender differences. In contrast, the high proportion of the EUBA students with (temporary) migration experiences allows this to be identified as a potentially important factor which requires further consideration for it was found that gendered differences are strongly inter-related with migration

experiences. Female migrants had much stronger risk taking propensities than female non-migrants in all but the comparative vague bet (Table 1, see significance tests), that is where uncertainty conditions are most pronounced. This was not true of male migrants and non migrants. Hence, when only non migrants are considered, the difference in risk taking between male and female non migrants is highly significant.

In taking account of self assessment of capabilities, there was evidence of overoptimism and overconfidence but no evidence that these affected bets in our pure risk experimental environment. Moreover, neither optimism nor overconfidence was related to migration experience. The lack of importance of competence, compared to previous studies in financial services in particular, reflects the pure chance environment of our experiment. Instead, the key findings was the importance of self-declared willingness to take risks amongst women in particular. As noted earlier, the average self-assessment for the statement 'I am willing to take higher risks' was significantly higher for female migrants than for female non-migrants (Table 1), whereas the difference between male migrants versus non-migrants was low and insignificant. There is little evidence here to suggest that migration experience has had a significant impact on self assessments of capabilities, such as adaptation to change. This suggests that higher propensity for risk taking amongst women migrants was not due to migration having changed their optimism about their capabilities. This is consistent with Sahm's (2007) and Jaegger et al's (2007) findings that willingness to take risk is relatively stable over time.

Finally, when considering these findings, a note of caution is required. The values of partial eta squared (see footnote 3) suggest that individual, within-subjects behaviour is very variable, as is also evident in the large standard deviations for average bets in Table 1. The substantial heterogeneity in individual estimates of risk preference and the incremental predictive power of risk tolerance was never found to be very high (similar to Barsky et al 1997 and Sahm 2007). In other words, measured risk tolerance explains only a small part of the variation in the behaviours studied. Nevertheless, the preferences discovered were statistically significant and consistent in diverse experimental conditions. The findings of the study also need to be placed in context of the sums of squares for within-subject effects being substantially higher than those between groups, including both migration and/or gender (Table 2). This is consistent with Barsky's et al (1997, 575) note on the relatively weak explanatory power of socio-demographic attributes in relation to risk, compared to individual variation in performance (across tasks).

Conclusions

The paper has sought to advance research on migration, risk and uncertainty through an application of some of the theories on willingness to take risk to a study of risk attitudes amongst students at Bratislava University of Economics. This provided a relatively homogenous group, in socio-demographic terms, while offering the possibility of studying a substantial sub sample of temporary (returned) international migrants. Risk attitudes were examined via willingness to take hypothetical gambles in a 'pure chance' risk environment. Particular emphasis was given to the gendering of attitudes. Although measured risk tolerance explains only a small part of the

variation in the behaviours studied, the preferences discovered were statistically significant and consistent in diverse experimental conditions.

The basic patterns of risk taking observed in the pure chance and competence informed contexts corresponded with those established by other researchers. Ambiguity aversion was evident in both comparative and non-comparative conditions. The amounts that individuals were willing to bet in a pure chance context were broadly similar to those found by Fox and Tversky (1995). While many experimental studies have examined gender differences in risk taking, to the best of our knowledge no previous research has tried to investigate the impact of migration experience on risk behaviour using experimental methods such as those described in the methodology section.

In terms of gender, a new finding in this study is that there are important gender differences when making decisions under *both* risk and uncertainty conditions in the Ellsberg paradox. However, the originality of this research lies in the comparison of migrants' and non-migrants' risk attitudes. Female migrants were more willing to take risks than non migrants, in a pure chance risk context, as represented by our experimental approach, as opposed to a competence environment. In the latter, it is known that males are more likely than females to be willing to take risks. The research did compare the self-assessment of capabilities, and willingness to take risk. There were virtually no differences with respect to self assessed capabilities. However, female migrants had significantly higher risk tolerance levels than female non migrants, regardless of perceived capabilities. The significant difference between female migrants and non migrants, compared to the relative similarity between male migrants and non migrants, in willingness to take risk is a key finding of this research.

There are limitations to this research. First, risk aversion was analysed for a sample of university students. Although this has advantages in terms of decreasing the heterogeneity in our sample, it is not clear how far the conclusions apply to other migrants, whether relatively unskilled labour migrants, retirement migrants, or permanent immigrants. Therefore, there is a need to extend this theoretical approach to other types of migrants, although this poses substantial practical methodological challenges. This reservation is especially important as the student migrants in our sample mostly moved within academic networks and student job programmes for relatively short time periods, while the barriers to return at any point in time were relatively low. It is also possible that many had some command of the destination country language. In other words, these student migrants had moved in a medium-low level uncertainty context and had some perceived competence and control over the outcomes of their migration decisions. Arguably, such migration may be especially attractive for women given the observation that women have higher level of ambiguity aversion than men. Indeed, although the existence of a distinctive group of risk tolerant female migrants was an important empirical finding of this research, even the risk tolerant female migrants in this study had levels of ambiguity aversion which were not much different from female non migrants. It can therefore be postulated that migrants moving in different migration contexts, with high levels of uncertainty, are likely to be highly distinctive, tending to very risk-tolerant and overconfident males.

Secondly, while migration in general seems to be characterised as being associated more with uncertainty than risk, not least because of the fluid and contested nature of

knowledge, it is rare for migration decisions to be made without any knowledge about the destination; therefore, decisions are rarely, if ever, made in full ignorance. Instead, migration should probably be characterised as being associated with expectations about risk that are formed under conditions of partial knowledge. This is perhaps best understood as a continuum of risk and uncertainty, but a fluid one with individuals moving in both directions along the continuum over time, at least in terms of personal understandings of the limitations of their knowledge. It is particularly difficult to analyse such fluidities within the conceptual and methodological framework that has been employed here. This signals the need for complementary research, perhaps of a qualitative nature, involving in-depth and preferably longitudinal research with individual migrants.

Thirdly, the study was based on differences between migrants and non migrants in their willingness to take risks in general rather than their willingness to take migration specific risks. Research by Jaeger et al (2007) suggests that there is of course some overlap between generic and specific measures, but this is an issue that needs to be returned to in future research.

Fourthly, the experimental design of this research does not provide direct evidence as to whether having migration experience had been facilitated by higher risk tolerance or whether migration experiences had made individuals more risk tolerant; this could be due to either the outcome of a successful migration experience, or increased knowledge of the requirements of migration. However, it is more likely that higher risk tolerance was a precursor of migration rather than vice versa. Jaeger et al (2007: 3), for example, discovered that risk tolerance/aversion was more effective in explaining the decision to migrate/stay, as opposed to the decision of how far to move. There is also evidence that risk tolerance levels are relatively stable over time and are not affected by major life events. Research by Sahm (2007) on responses from a panel of over 12,000 individuals in the 1992 to 2002 waves of the US Health and Retirement Study, for example, revealed that neither changes in wealth and income, nor experience of job displacement substantially affected risk tolerance. Instead, more risk tolerant individuals were more likely to prefer more risky careers. Extrapolating from Sahm's research, it can be suggested that the female EUBA migrants had a stronger preference for migration experiences because they were more risk tolerant. The ultimate proof of the stability of risk attitudes, however, requires a longitudinal methodology and is a task for future research.

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Table 1. Impact of gender and migration on willingness to take risks and self-assessed capabilities: t tests (values of bets, untransformed variables)

	Females			Males		
	Work/study abroad		T tests for differences	Work/study abroad		T tests for differences
	Yes	No		Yes	No	
Bets within the Ellsberg paradox, Euro						
Clear bet, comparative	24.34 (22.31)	19.34 (19.96)	t = -1.992 Sig. 0.047	22.70 (20.17)	27.03 (22.08)	t = 1.239 Sig. 0.217
Vague bet, comparative	18.31 (18.49)	15.93 (16.75)	t = -1.126 Sig. 0.261	18.56 (20.89)	22.03 (20.98)	t = 1.022 Sig. 0.308
Clear bet, non-comparative	22.72 (21.52)	16.85 (17.52)	t = -2.426 Sig. 0.016	20.96 (19.57)	25.40 (21.86)	t = 1.206 Sig. 0.230
Vague bet, non-comparative	21.66 (21.00)	16.85 (18.12)	t = -1.975 Sig. 0.049	20.77 (19.20)	24.53 (21.99)	t = 1.018 Sig. 0.310
Self-assessment of capabilities^{a)}						
I am more flexible when adapting to new situations	6.32 (2.12)	5.87 (2.15)	t = -1.794 Sig. 0.074	6.15 (2.22)	6.58 (2.08)	t = 1.360 Sig. 0.175
I evaluate situations more correctly and take better decisions	5.75 (1.78)	5.76 (1.73)	t = 0.066 Sig. 0.948	6.69 (1.66)	6.84 (1.67)	t = 0.569 Sig. 0.570self-a
I handle problems better	5.88 (1.71)	5.68 (1.65)	t = -1.029 Sig. 0.304	6.40 (1.49)	6.42 (1.91)	t = 0.071 Sig. 0.944
I have no problems with my studies	7.46 (1.72)	7.27 (1.89)	t = -0.881 Sig. 0.379	7.56 (1.79)	6.87 (2.26)	t = -2.157 Sig. 0.032
I am willing to take higher risks	4.89 (2.14)	4.13 (2.03)	t = -3.112 Sig. 0.002	5.79 (2.14)	5.74 (2.18)	t = -0.154 Sig. 0.878

Notes: Notes: t-test: significance levels (Sig.) for two-tailed test. Standard deviations in parenthesis.

- a) Question wording: Please compare yourself to your best friends and rate your abilities on a scale from 0 = certainly not to 10 = certainly yes with respect to each of the following statements.

Table 2. Mixed-design ANOVA in chance context (Ellsberg paradox): within-subjects and between-groups effects

	Type IV Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Test of Within-Subjects effects						
prospect	59.247	1	59.247	88.783	0.000	0.184
prospect * gender	1.595	1	1.595	2.390	0.123	0.006
prospect * migration	0.401	1	0.401	0.601	0.438	0.002
prospect * gender * migration	1.237	1	1.237	1.853	0.174	0.005
error (prospect)	263.595	395	0.667			
condition	0.080	1	0.080	0.076	0.784	0.000
condition * gender	1.175	1	1.175	1.113	0.292	0.003
condition * migration	2.048	1	2.048	1.940	0.164	0.005
condition * gender * migration	0.047	1	0.047	0.044	0.833	0.000
error (condition)	416.875	395	1.055			
prospect * condition	44.026	1	44.026	80.668	0.000	0.170
prospect * condition * gender	2.690	1	2.690	4.929	0.027	0.012
prospect * condition * migration	0.074	1	0.074	0.135	0.713	0.000

prospect * condition *	0.026	1	0.026	0.048	0.827	0.000
gender * migration						
error (prospect*condition)	215.580	395	0.546			
Tests of Between-Group Effects						
intercept	5795.439	1	5795.439	1673.510	0.000	
gender	10.634	1	10.634	3.071	0.080	
migration	0.036	1	0.036	0.010	0.919	
gender * migration	17.749	1	17.749	5.125	0.024	
error	1367.903	395	3.463			

Notes:

df = degrees of freedom,

Within Subjects Design: prospect + condition + prospect * condition.

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References

Barber, B.B, and T. Odean 2001. Boys Will Be Boys: Gender, Overconfidence and Common Stock Investment. *The Quarterly Journal of Economics* 116, no. 1: 261-292.

Barsky, R., T. Juster, M. Kimball, and M. Shapiro. 1997. Preference parameters and behavioral heterogeneity: An experimental approach in the Health and Retirement Study. *The Quarterly Journal of Economics* 112, no. 2: 537-579.

Bernasek, A., and S. Shwiff. 2001. Gender, Risk, and Retirement. *Journal of Economic Issues*. 35, no. 2: 345-357.

Byrnes J.P., D.C. Miller, and W.D. Schafer. 1999. Gender differences in risk taking: A meta-analysis. *Psychological Bulletin* 125, no. 3: 367-383

Camerer, C., and D. Lovallo. 1999. Overconfidence and Excess Entry: An Experimental Approach. *The American Economic Review* 89, no. 1: 306-318

Camerer C, and M. Weber. 1992. Recent developments in modelling preferences: Uncertainty and ambiguity. *Journal of Risk and Uncertainty* 5, no. 4: 325-370.

Cohen, J. 1988. *Statistical power analysis for the behavioral sciences (2nd ed.)*. Hillsdale NJ: Lawrence Earlbaum Associates.

Chiswick, B.R. 2000. Are Immigrants Favorably Self-Selected? An Economic Analysis, Chapter 3 In *Migration Theory: Talking Across the Disciplines*, ed. Brettell C.D. and J.H. Hollifield, 52-76. New York: Routledge.

Daruvala, D. 2007. Gender, risk and stereotypes. *Journal of Risk and Uncertainty*. 35, no. 3: 265-283.

Dohmen, J.T., A. Falk, D. Huffman, U. Sunde, J. Schupp, and G.G. Wagner. 2005. *Individual Risk Attitudes: New Evidence from a Large, Representative, Experimentally-Validated Survey*. IZA Discussion Paper No. 1730, September 2005. Bonn: Institute for the Study of Labor (IZA).

Dohmen, J.T., A. Falk, D. Huffman, U. Sunde, J. Schupp, and G.G. Wagner. 2005. *Individual Risk Attitudes: New evidence from large, representative, experimentally-*

- validated survey. *CEPR Discussion Paper No. 5517*. London: Centre for Economic Policy Research.
- Donkers, B., B. Melenberg, and A. van Soest. 2001. Estimating Risk Attitudes using Lotteries: A Large Sample Approach. *The Journal of Risk and Uncertainty* 22, no. 2: 165-195.
- Ellsberg, D. 1961. Risk, Ambiguity, and the Savage Axioms. *The Quarterly Journal of Economics*. 75, no. 4: 643-669.
- Fehr-Duda, H., M. de Gennaro, and R. Schubert. 2006. Gender, Financial Risk and Probability Weights. *Theory and Decision* 60, no. 2-3: 283–313.
- Fox, C.R., and A. Tversky. 1995. Ambiguity aversion and comparative ignorance. *The Quarterly Journal of Economics* 110, no. 3: 585-603.
- Fox C.R, and N. Weber. 2002. Ambiguity Aversion, Comparative Ignorance and Decision Context. *Organizational Behavior and Human Decision Processes* 88, no. 1: 476–498.
- Heath, C., and A. Tversky. 1991. Preference and Belief: Ambiguity and Competence in Choice under Uncertainty. *Journal of Risk and Uncertainty* 4, no. 1: 5-28.
- Halek, M., and J.G. Eisenhauer. 2001. Demography of Risk Aversion. *The Journal of Risk and Insurance* 68, no. 1: 1-24.
- Hartog, J., A. Ferrer-i-Carbonell, and N. Jonker. 2000. *On a Simple Measure of Individual Risk Aversion*, CESifo Working Paper Series No. 363, Munich: Center for Economic Studies and Ifo Institute for Economic Research.
- Holt C.A., and S.K. Laury. 2002. Risk Aversion and Incentive Effects. *The American Economic Review* 92, no 5: 644-1655.
- Chow, C.C., and R.K. Sarin. 2001. Comparative Ignorance and the Ellsberg Paradox. *Journal of Risk and Uncertainty* 22, no. 2: 129-139.
- Jaeger, D.A., H. Bonin, A. Falk, D. Huffman, T. Dohmen, and U. Sunde. 2007. *Direct Evidence on Risk Attitudes and Migration*. Discussion Paper No. 265, Berlin: Institute for the Study of Labour.
- Knight, F.H. 1921. *Risk, uncertainty and profit*. Boston: Houghton Mifflin.
- Knutson, B., G.E. Wimmer, C.M. Kuhnen, and, P. Winkielman . 2008. Nucleus accumbens activation mediates the influence of reward cues on financial risk taking. *NeuroReport*. 19, no. 5: 509-513.
- Ktori, M., W.J.B van Heuven, and N.J. Pitchford. 2008. GreekLex: A lexical database of Modern Greek. *Behavior Research Methods* 40, no. 3: 773-783.
- Lovaglio, D, and D. Kahneman. 2003. Delusions of Success. How Optimism Undermines Executives' Decisions. *Harvard Business Review* 81, no. 7: 56-63.
- Massey, D.S., J. Arango, G. Hugo, A. Kouaouci, A. Pellegrino, and J.E. Taylor. 1993. 'Theories of International Migration: A Review and Appraisal'. *Population and Development Review* 19, no. 3: 431-466.
- Mistrík J. 1983. *Moderná slovenčina {Modern Slovak}*. Bratislava: Slovenské pedagogické nakladateľstvo.

- von Neumann, J., and O. Morgenstern. 1944. *Theory of Games and Economic Behavior*. : Princeton: Princeton University Press.
- Sahm, C.R. 2007. Does Risk Tolerance Change? *Job Market Paper*. January 2007. Michigan: University of Michigan.
- Roberts, K.D., and M.D.S. Morris. 2003. 'Fortune, Risk, und Remittances: An Application of Option Theory to Participation in Village-Based Migration Networks'. *International Migration Review*. 37, no. 4: 12152-81.
- Ronay, R., and D.Y.Kim, 2006. Gender differences in explicit and implicit risk attitudes: A socially facilitated phenomenon. *British Journal of Social Psychology* 45, no. 2: 397-419.
- Savage, L.J. 1954. *The Foundations of Statistics*, originally published by New York: Wiley, 2nd revised edition, reprinted by the Dover Publications (1972).
- Schubert, R., M. Brown, M. Gysler, and H.W. Brachinger. 1999. Financial Decision-Making: Are Women Really More Risk Averse? *American Economic Review Papers and Proceedings* 89, no. 2: 381-385.
- Tversky, A., and D. Kahneman. 1974. 'Judgement under uncertainty: Heuristics and biases'. *Science* 185: 1124-1131.
- Tversky, A., and D. Kahneman. 1992. Advances in Prospect Theory: Cumulative Representation of Uncertainty. *Journal of Risk and Uncertainty* 5, no. 4: 297-323.